

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

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13. (new): A threading control method for performing a threading operation by moving, in synchronization with rotation of a main spindle, either a cutter or a workpiece in a feeding spindle direction, characterized in that threading start timing is altered based on at least a servo-spindle acceleration time-constant for the feeding spindle, in a situation in which the identical workpiece is threaded either at a feed rate different from a previous feed rate, or on a machine different from a previously used machine.

14. (new): A threading control method according to claim 13, wherein thread phase displacement is converted to a threading-start timing shift, and the threading start timing is altered based on the threading-start timing shift and on a main spindle single-rotation signal.

15. (new): A threading control method according to claim 13, wherein the threading start timing is altered based on a mechanical error due to individual differences in threading machines.

16. (new): A threading control method according to claim 14, wherein the threading start timing is altered based on a mechanical error due to individual differences in threading machines.

17. (new): A threading control method according to claim 15, wherein the mechanical error due to individual differences in threading machines includes a component of the thread phase displacement, in accordance with the feeding spindle feed rate.

18. (new): A threading control method according to claim 16, wherein the mechanical error due to individual differences in threading machines includes a component of the thread phase displacement, in accordance with the feeding spindle feed rate.

19. (new): A threading control method according to claim 15, wherein the mechanical error due to individual differences in threading machines includes a constant component of the thread phase displacement, independent of the feeding spindle feed rate.

20. (new): A threading control method according to claim 16, wherein the mechanical error due to individual differences in threading machines includes a constant component of the thread phase displacement, independent of the feeding spindle feed rate.

21. (new): A threading control method according to claim 15, wherein a component of the thread phase displacement, in accordance with the feeding spindle feed rate, and a constant component of the thread phase displacement, independent of the feeding spindle feed rate are inputted as parameters, and the threading start timing is altered based on the inputted parameters.

22. (new): A threading control method according to claim 16, wherein a component of the thread phase displacement, in accordance with the feeding spindle feed rate, and a constant component of the thread phase displacement, independent of the feeding spindle feed rate are inputted as parameters, and the threading start timing is altered based on the inputted parameters.

23. (new): A threading control method for performing a threading operation by moving, in synchronization with rotation of a main spindle, either a cutter or a workpiece in a feeding spindle direction, the method comprising:

a step of outputting a thread-pitch command value and a programmed main-spindle rotation frequency by means of a machining program,

a step of calculating a first servo feed rate based on the thread-pitch command value and the programmed main-spindle rotation frequency,

a step of calculating a second servo feed rate based on the thread-pitch command value, the programmed main-spindle rotation frequency and a main-spindle override input from outside,

a step of calculating a main-spindle threading -start timing shift based on the first servo feed rate , the second servo feed rate and a servo-spindle acceleration time-constant for the

feeding spindle in a situation in which the identical workpiece is threaded either at a feed rate different from a previous feed rate, or on a machine different from a previously used machine, a step of altering the threading-start timing by the main-spindle threading -start timing shift.

24. (new): A threading control method according to claim 23, wherein thread phase displacement is converted to a threading-start timing shift, and the threading start timing is altered based on the threading-start timing shift and on a main spindle single-rotation signal.

25. (new): A threading control method according to claim 23, wherein the threading start timing is altered based on a mechanical error due to individual differences in threading machines.

26. (new): A threading control method according to claim 24, wherein the threading start timing is altered based on a mechanical error due to individual differences in threading machines.

27. (new): A threading control system for performing a threading operation by moving, in synchronization with rotation of a main spindle, either a cutter or a workpiece in a feeding spindle direction,
characterized in that

a main-spindle angle computing section altering threading start timing, based on a servo-spindle acceleration time-constant for the feeding spindle, in a situation in which the identical workpiece is threaded either at a feed rate different from a previous feed rate, or on a machine different from a previously used machine.

28. (new): A threading control system according to claim 27, wherein the main-spindle angle computing section converts thread phase displacement to a threading-start timing shift, and, based on the threading-start timing shift and on a main-spindle single-rotation signal, alters the threading start timing.

29. (new): A threading control system according to claim 27, wherein the main-spindle angle computing section alters the threading start timing based on a mechanical error due to individual differences in threading machines.

30. (new): A threading control system according to claim 28, wherein the a main-spindle angle computing section alters the threading start timing based on a mechanical error due to individual differences in threading machines.

31. (new): A threading control system according to claim 29, wherein the mechanical error due to individual differences in threading machines includes a component of the thread phase displacement, in accordance with the feeding spindle feed rate.

32. (new): A threading control system according to claim 30, wherein the machines includes a component of the thread phase displacement, mechanical error due to individual differences in threading in accordance with the feeding spindle feed rate.

33. (new): A threading control system according to claim 29, wherein the mechanical error due to individual differences in threading machines includes a constant component of the thread phase displacement, independent of the feeding spindle feed rate.

34. (new): A threading control system according to claim 30, wherein the mechanical error due to individual differences in threading machines includes a constant component of the thread phase displacement, independent of the feeding spindle feed rate.

35. (new): A threading control system according to claim 29, wherein the main-spindle angle computing section alters the threading start timing based on a component of the thread phase displacement, in accordance with the feeding spindle feed rate, and on a constant component of the thread phase displacement, independent of the feeding spindle feed rate, which have been inputted as parameters.

36. (new): A threading control system according to claim 30, wherein the main-spindle angle computing section alters the threading start timing based on a component of the thread

phase displacement, in accordance with the feeding spindle feed rate, and on a constant component of the thread phase displacement, independent of the feeding spindle feed rate, which have been inputted as parameters.

37. (new): A threading control system for performing a threading operation by moving, in synchronization with rotation of a main spindle, either a cutter or a workpiece in a feeding spindle direction, the system comprising:

- a machining program analyzing section outputting a thread-pitch command value and a programmed main-spindle rotation frequency by means of a machining program,

- a threading computing section calculating a first servo feed rate based on the thread-pitch command value and the programmed main-spindle rotation frequency,

- and calculating a second servo feed rate based on the thread-pitch command value and the programmed main-spindle rotation frequency and a override input from outside,

- a machining program analyzing section outputting a thread-pitch command value and a programmed main-spindle rotation frequency based on a machining program.

- a threading computing section calculating a first servo feed rate based on the thread-pitch command value and the programmed main-spindle rotation frequency,

- and calculating a second servo feed rate based on the thread-pitch command value and the programmed main-spindle rotation frequency and a override input from outside,

- a main-spindle angle computing section calculating a first servo feed rate and a second servo feed rate according to thread-pitch command value and programmed main-spindle rotation

frequency, and calculating a main-spindle threading -start timing shift based on the first servo feed rate, the second servo feed rate and a servo-spindle acceleration time-constant for the feeding spindle in a situation in which the identical workpiece is threaded either at a feed rate different from a previous feed rate, or on a machine different from a previously used machine, and altering the threading-start timing by the main-spindle threading-start timing shift.

38. (new): A threading control system according to claim 37, wherein the main-spindle angle computing section converts thread phase displacement to a threading-start timing shift, and, based on the threading-start timing shift and on a main-spindle single-rotation signal, alters the threading start timing.

39. (new): A threading control system according to claim 37, wherein the main-spindle angle computing section alters the threading start timing based on a mechanical error due to individual differences in threading machines.

40. (new): A threading control system according to claim 38, wherein the main-spindle angle computing section alters the threading start timing based on a mechanical error due to individual differences in threading machines.